

# **16<sup>th</sup> Annual Pollution Prevention Conference & Trade Show**

## **Business Value of Pollution Prevention & Sustainability** International Case Studies

**Fred Granek**  
**Canadian Centre**  
**for Pollution**  
**Prevention**



**Bruce Taylor**  
**Enviro-**  
**Stewards Inc.**



**Enviro-Stewards**  
Engineers & Scientists





# **Business Value of Pollution Prevention & Sustainability**

## **International Case Studies**

Fred Granek

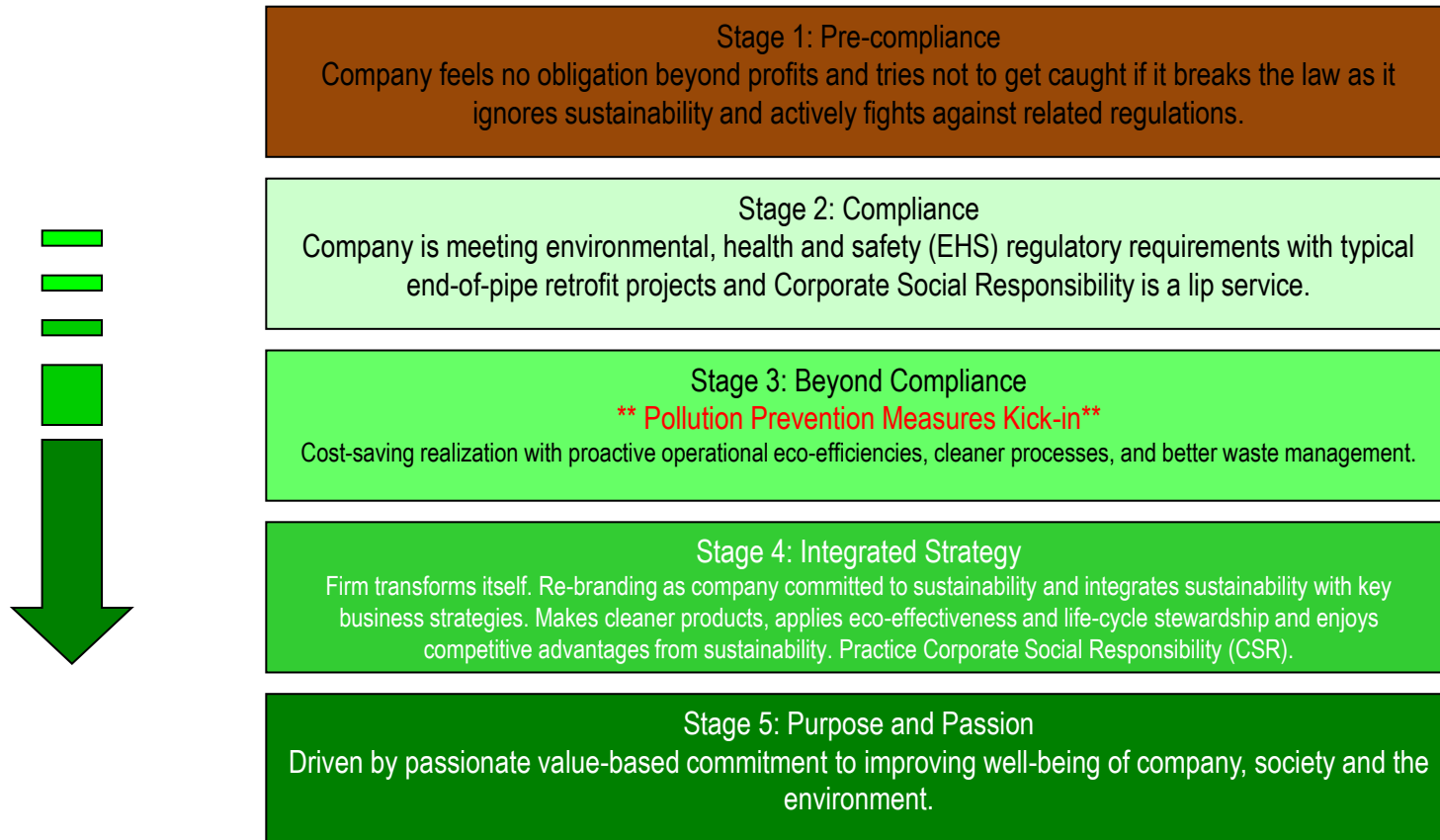
Canadian Centre for Pollution  
Prevention



Canadian Centre  
for Pollution Prevention

Leaders Shaping the Future of Sustainable Production & Consumption

# Motivating Behavior Change



Source: Adapted from Williard, 2005 and Freeman et al, 2000



# What is Pollution Prevention (P2)?

## P2 Practices

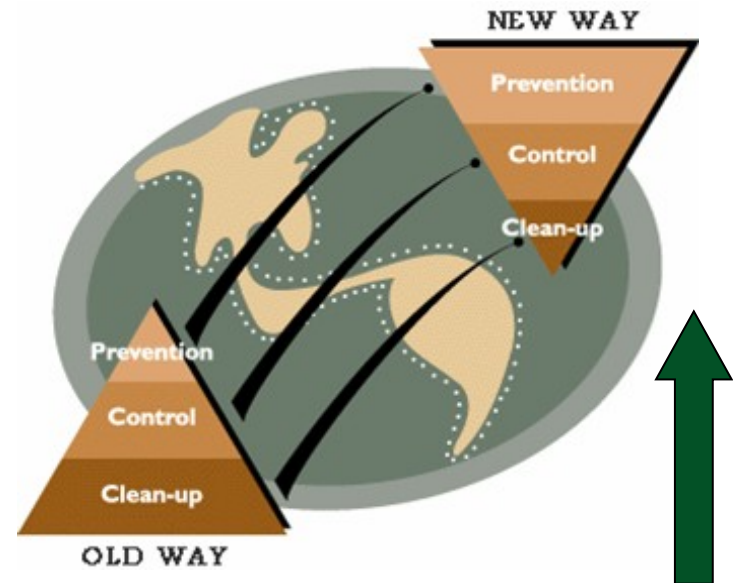
- Product redesign and reformulation
- Equipment modification and process changes
- Material and feedstock substitution
- Operating efficiencies and training
- Purchasing techniques and inventory management
- On-site reuse and recycling
- Spill and leak prevention

*"The use of processes, practices, materials, products or energy that avoid or minimize the creation of pollutants and wastes at the source"* Canadian Council of Ministers of the Environment (CCME), 1996

## What is NOT P2?

- Off-site recycling
- Waste treatment: Concentrating hazardous waste to reduce volume or toxicity; Dilution of waste to reduce concentration
- Transfer of waste from one medium to another (eg. wastewater contaminant becomes air pollutant)

ANTICIPATE AND PREVENT



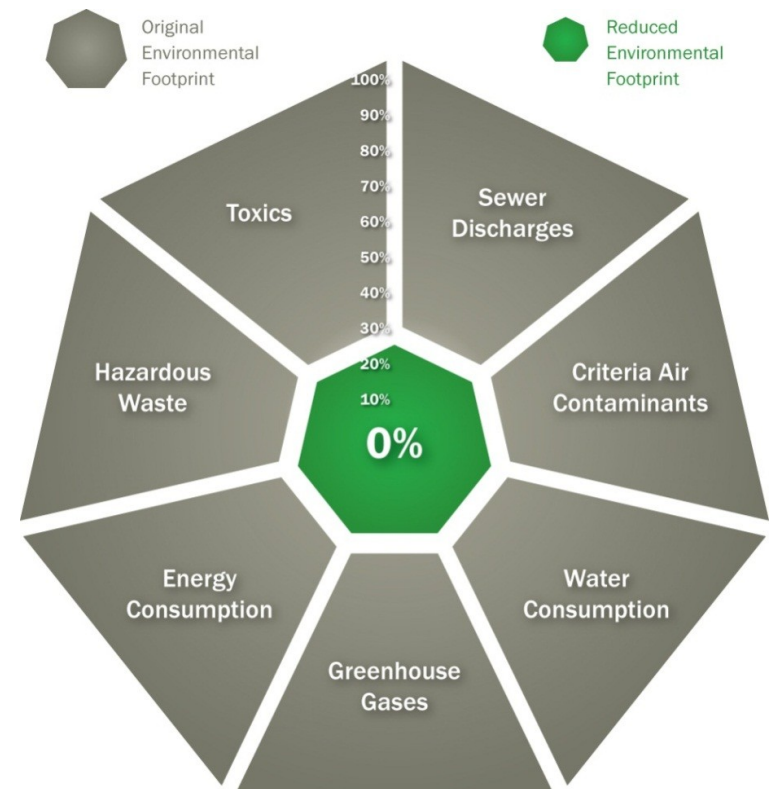
REACT AND CURE





# Ontario On-Site Technical Assistance Program

A one-stop pollution prevention (P2), toxics reduction & energy efficiency **technical assistance** program with **funding incentive** for small-to-medium sized (SME) manufacturers in **Ontario**



# Program Partners



# Public Sector Priorities

## ➤ Ontario Ministry of the Environment

- ✓ Toxics Reduction Act, 2009
- ✓ Cleaner & Greener Manufacturing Program
- ✓ Criteria Air Contaminants & Climate Change Gases
- ✓ Hazardous Waste

## ➤ Environment Canada

- ✓ Canadian Environmental Protection Act (CEPA) 1999: Pollution Prevention Planning & National Pollutant Release Inventory (NPRI)
- ✓ Chemical Management Plan
- ✓ Clean Air Act

## ➤ Regional & Municipal Governments

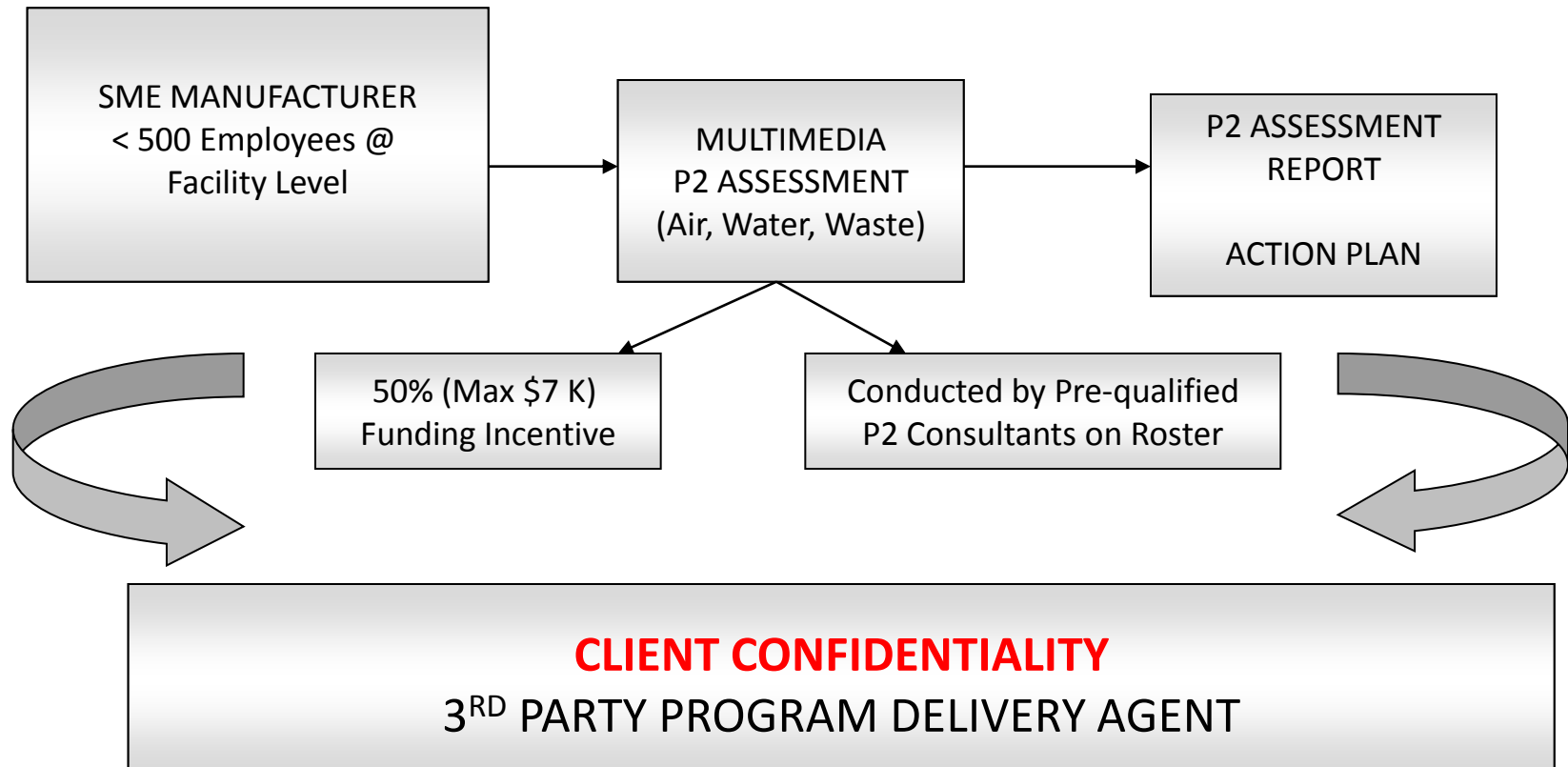
- ✓ Sewer Use & Storm Water By-Laws
- ✓ Greening & Sustainability Goals

## ➤ Conservation Authorities

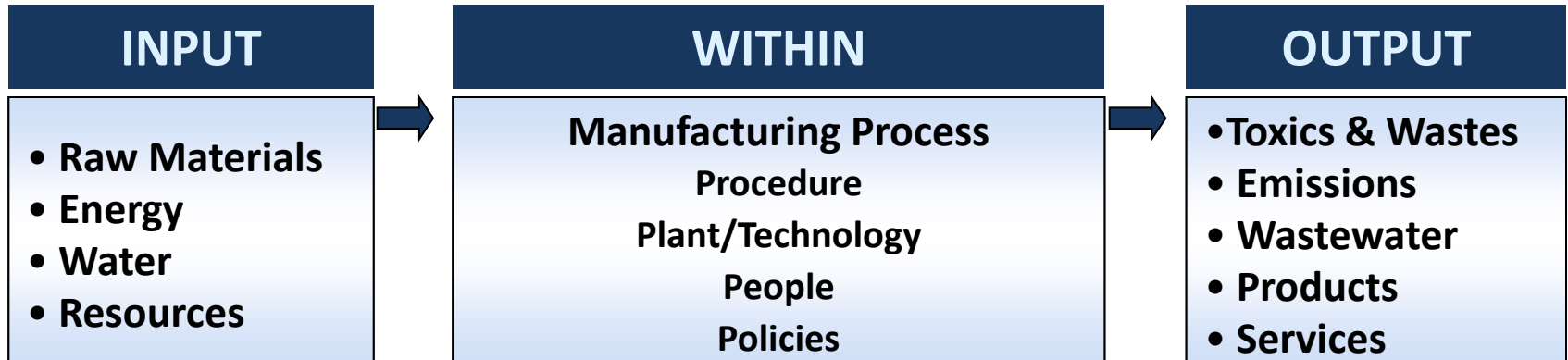
- ✓ Watershed Protection



# Ontario On-site Technical Assistance Program Model

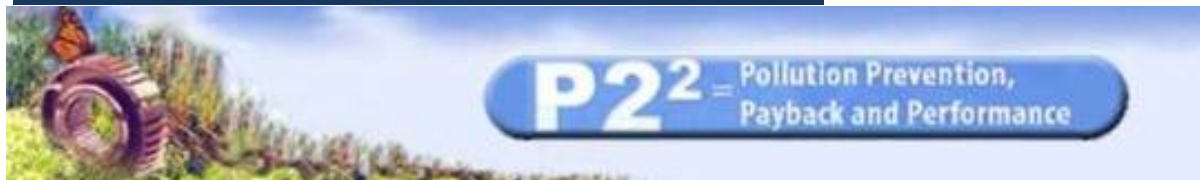
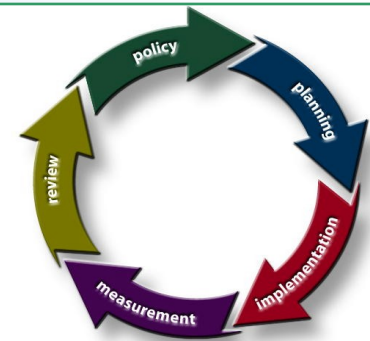


# Process Mapping for Integrated Assessments



1. Process Mapping
2. Materials Accounting: Waste Inventory & Characterization
3. Prioritize Waste Sources
4. Root Cause Analysis: Root Causes of Toxics, Pollutants & Wastes
5. Development of P2 Alternatives
6. Business Case for Implementation

Cycle of Continual Improvement...



# The Business Case

**Financials**

**OPPORTUNITIES**

**RISKS**

**Non-financials  
/ Reputation**

**Company Value**

- **Cost Avoidance**
  - Cost savings
  - Payback period
  - Operational Efficiencies
- **Business Risks Reduction**
  - Hidden costs of non-compliance
  - Workers Health & Safety
  - Spills, fines, high remediation costs
  - Changing regulations
- **Competitive Advantage**
  - Green marketing
  - Access to Global markets



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# Case Study: Petroleum Products

## Anonymous



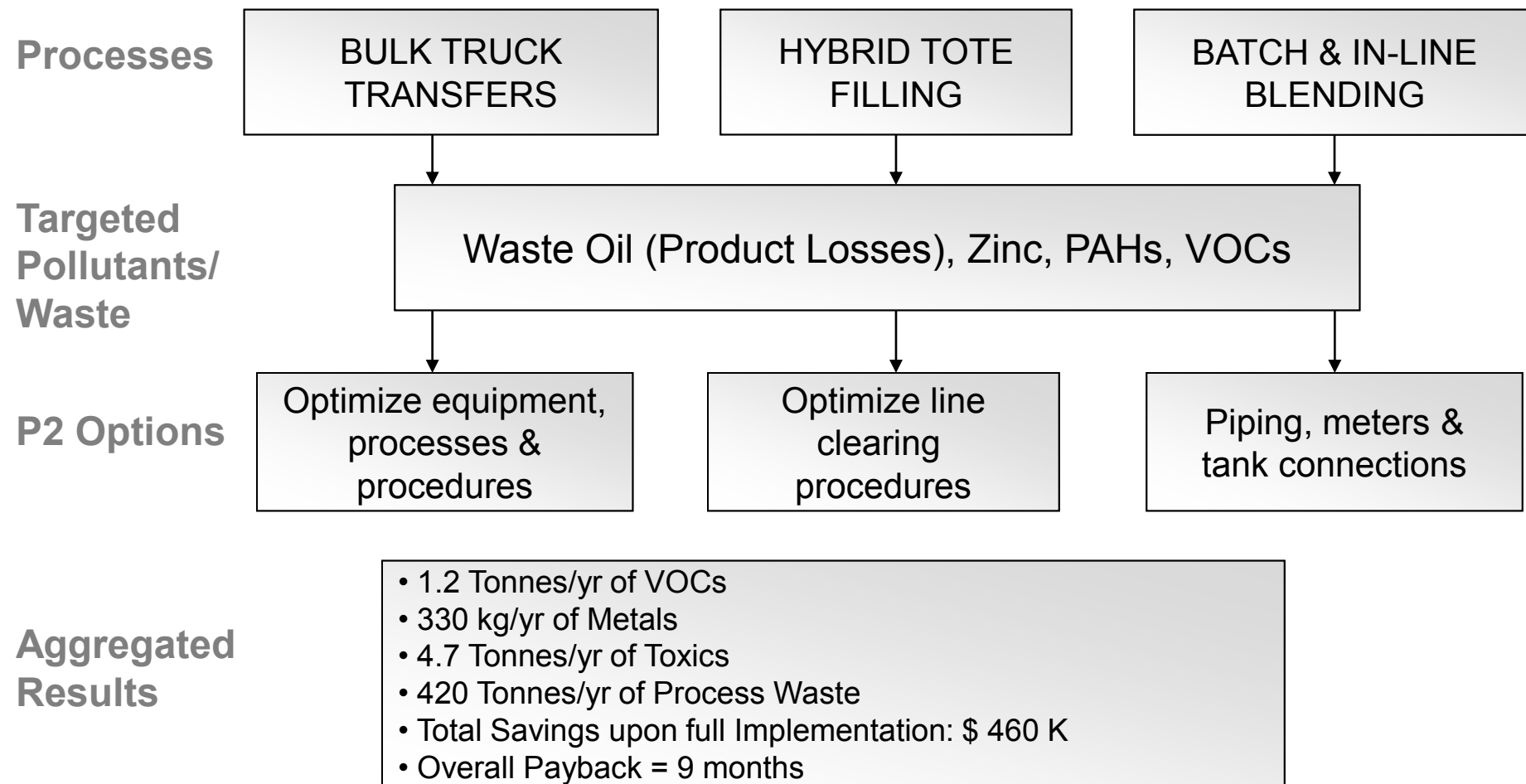
- 80-person petroleum product producer
- Automotive & industrial motor oil and lubricant manufacturing, plastic bottle manufacturing
- **Key Processes:**
  - ✓ Bulk truck transfer
  - ✓ Hybrid tote filling
  - ✓ Batch & in-line blending
  - ✓ Filling operations
- **Participation Drivers:**
  - ✓ Municipal sewer use by-law (storm water discharge)
  - ✓ Cost savings
  - ✓ ISO 14001



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# Case Study: Petroleum Products



# Case Study: Printer

## Bowne of Canada



*Bowne's Press Room*

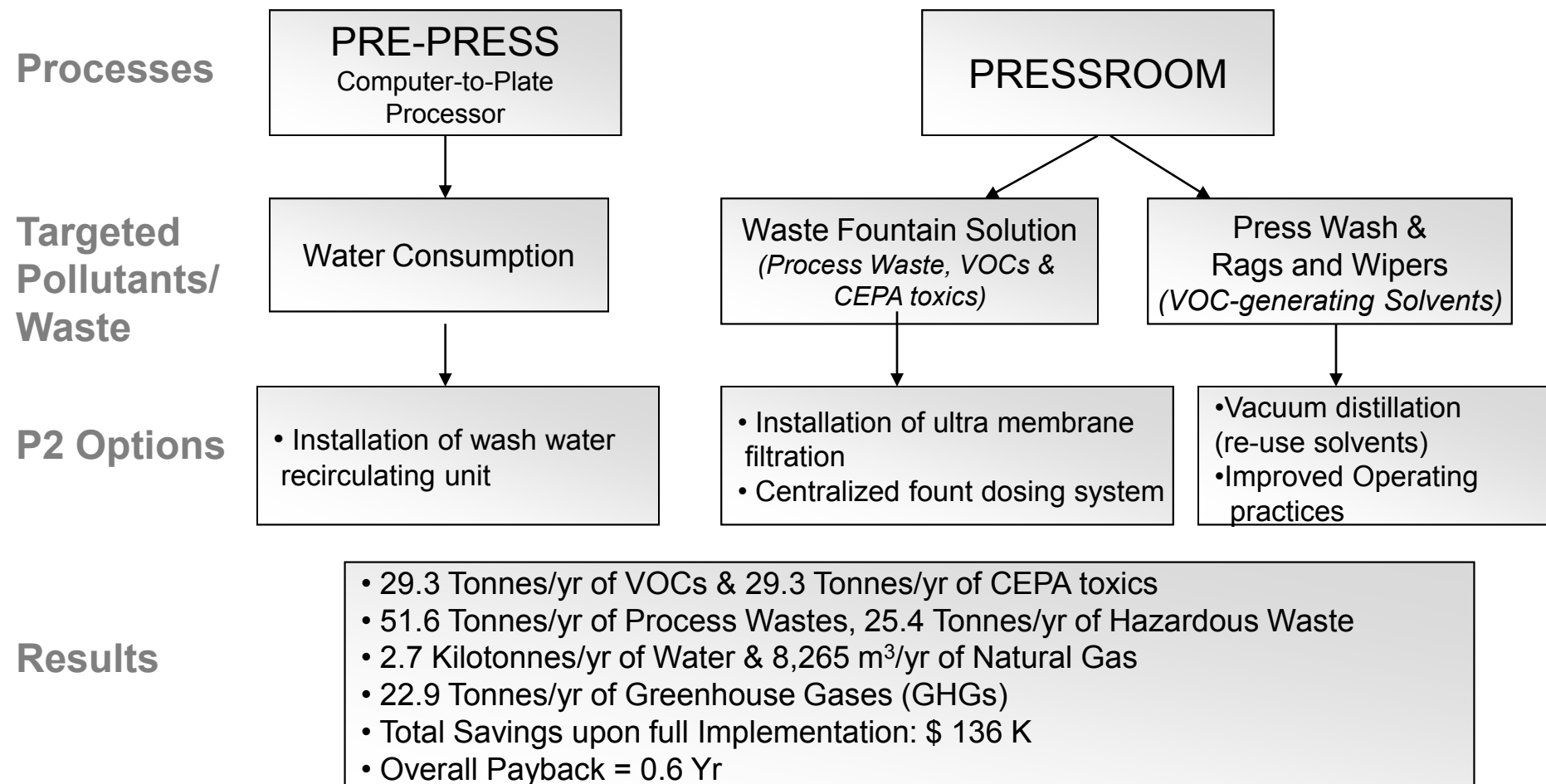
- 203-person document management & lithographic printing company
- *“BLOOM and EcoSafe have been instrumental in helping us re-align our goals. We now have a solid action plan in place which will pay dividends and assist us on the road to true environmental sustainability.”*

**Brian Arrol, Environmental Health & Safety Manager**



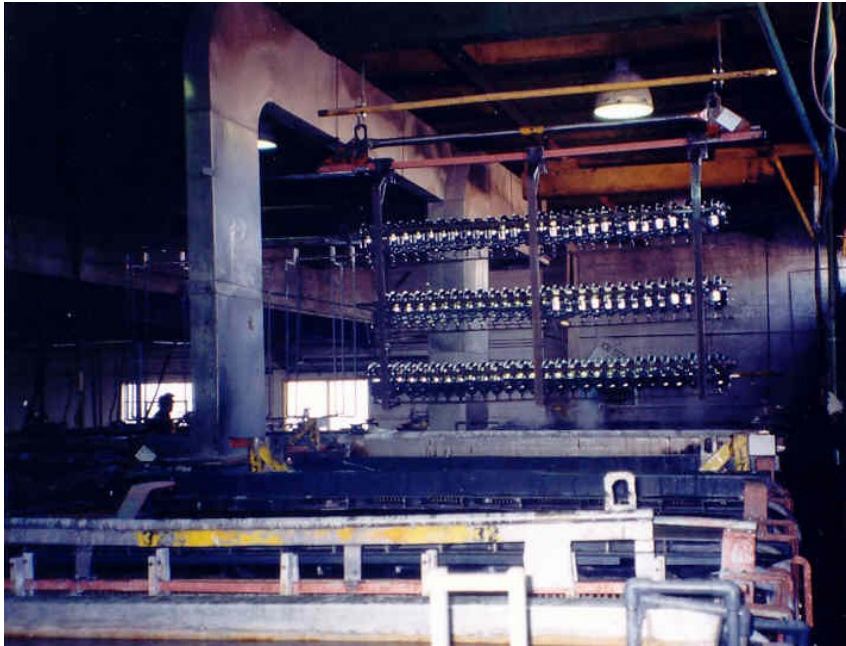
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# Case Study: Printer





# Case Study: Metal Finishing



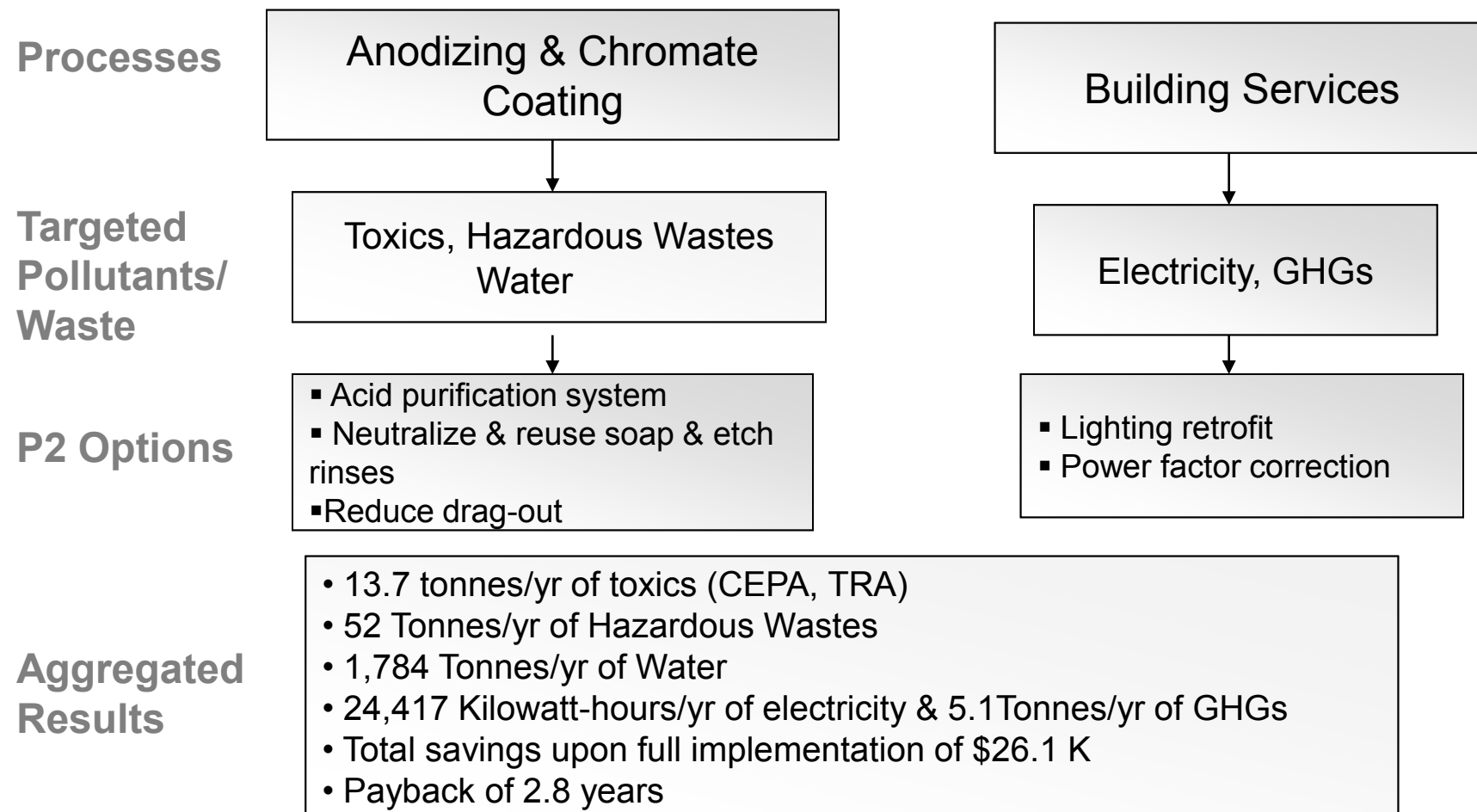
*During the anodizing process, pieces are moved from one tank to another using a conveyor system.*

## West-Tech Finishing

- 18-person anodizing job shop specializing in applying finishes to aluminum parts
- Main processes: anodizing & chromate coating; building services
- Participation drivers:
  - ✓ Sewer-use by-law limits
  - ✓ Toxics Reduction Act
  - ✓ Desire to be most modern & efficient anodizer



# Case Study: Metal Finishing





# Ontario On-site Technical Assistance: Participation

Number of Program Clients (December 2012)	91
Number of P2 Assessments Completed	85
Total Number of P2 Projects Implemented or underway	638
Number of Case Studies	48

90% of program clients are implementing “all” or “most” of the P2 projects recommended in the assessment reports.



# Ontario On-site Technical Assistance: Clientele By Sector

- Aerospace (1)
- Auto Parts (2)
- Chemical (13)
- Circuit Board (3)
- Container/Tanker Cleaning (3)
- Cosmetics (1)
- Courier Service (1)
- Electrical Equipment(1)
- Food Processing (7)
- Foundry (1)
- Furniture (3)
- Heat Exchanger (1)
- Hospitals (4)
- Metal Finishing & Fabrication (9)
- Packaging (3)
- Paint/Coatings (4)
- Petroleum Products (1)
- Pharmaceutical (1)
- Printing – Lithographic (24)
- Printing – Flexographic Plate (2)
- Printing – Plastic (1)
- Printing – Roller (1)
- Rapid Transit (1)
- Plastic Products(2)
- Steel Tubular Products (1)



# Ontario On-site Technical Assistance: Reductions

## P2 Reductions (Annual)

▪ Volatile Organic Compounds (VOCs)	865 Tonnes
▪ Fine Particulate (PM <10u)	16 Tonnes
▪ Metals	326 Tonnes
▪ Toxics (CEPA)	4,841 Tonnes
▪ Toxics (TRA – from 2010)	639 Tonnes
▪ Hazardous Wastes	3,047 Tonnes
▪ Process Wastes	8,964 Tonnes
▪ Water	1,027 Kilotonnes
▪ Energy (Natural Gas)	4,802,418 Metres <sup>3</sup>
▪ Energy (Electricity)	11,435 MW-hrs
▪ Green House Gases (GHGs)	13,617 Tonnes



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# Ontario On-site Technical Assistance: Reductions

Targeted Pollutants and Wastes	P2 Reductions (Annual)	Comparative Representation
CEPA Toxics	4,841 Tonnes	Weight of approximately 1,867 SUVs
Water	1,027 Kilotonnes (1 Billion Litres)	Flushing the Toilet approximately 171 Million Times



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# Ontario On-site Technical Assistance: Financial Results

## Totals

- Savings (Annualized) \$9.4 million
- Capital Investment \$9.1 million
- Payback **12 Months**





# Ontario On-site Technical Assistance: Tax Implications

- Additional Annual Federal & Provincial Corporate Taxes      \$1.5 million
- Additional Future Corporate Taxes – 20 Years      \$48.2 million





# Key Program Outcomes

- Implementation rate: 90%
- Payback  $\leq$  1 year
- Clients with public case studies: 50%
- Number of P2 projects/client: 7.5



# Testimonials

- **Senior Executive Seminars & Facility Staff Workshops**

*“My expectation was very focused on the Toxics Reduction Act and was not thinking about the bigger picture and our bottom line. Very helpful to think beyond regulations, thanks!”*

- **On-Site Technical Assistance Program**

*“The on-site technical assistance program played an integral role in assisting Trimac with meeting and exceeding our environmental challenges. The smooth delivery of the program was exactly as we had anticipated which made our goals easier to attain.”*

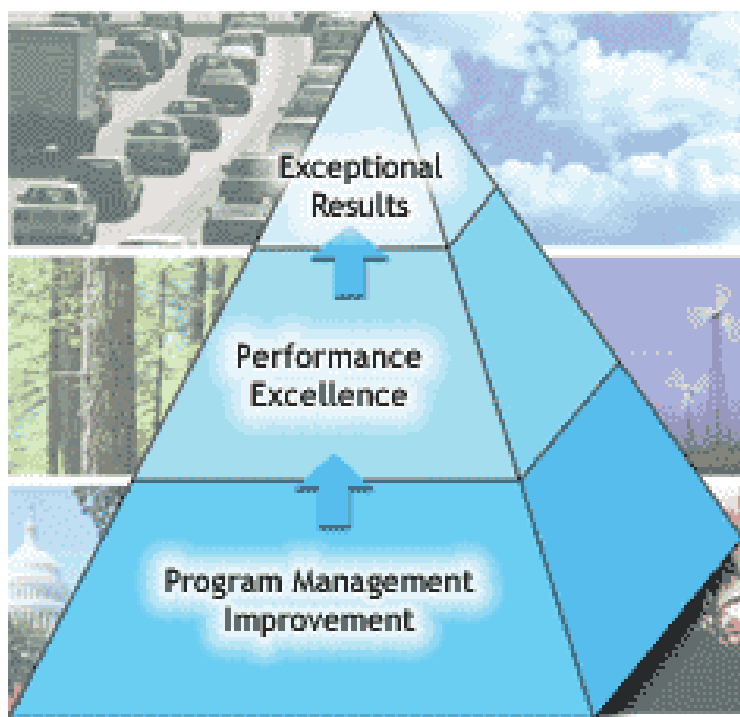
**Paul Craig, Trimac Transportation**



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# Insights & Lessons Learned



*Building the Foundation for Our Future*

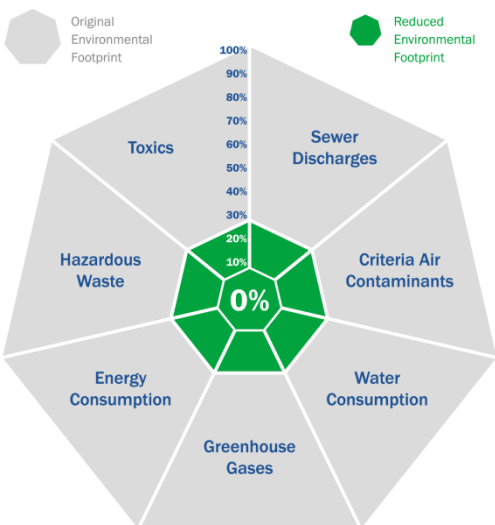
- Third Party Delivery Agent Complements Regulatory Tools
- Integration of Multiple Government Priorities
- Mix of Regulatory & Non-Regulatory Drivers
- Flexibility & Broad Choice of Action



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# Contact Information



**Thank You!!**

**Fred Granek**

**Canadian Centre for Pollution  
Prevention**

**3 Innisbrook Crescent**

**Thornhill, Ontario**

**L3T 5A9**

**Phone: (905) 731-4482**

**Cell: 416-723-4873**

**E-mail: [fred.granek.c2p2@gmail.com](mailto:fred.granek.c2p2@gmail.com)**



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# Business Value of P2 & Sustainability

## International Case Studies

### ENVIRO-STEWARDS

*Sustainability Catalysts*

Certified



Corporation™  
bcorporation.net



September 26, 2013

SAVE.SUSTAIN.SHARE.  
[www.enviro-stewards.com](http://www.enviro-stewards.com)



Enviro-Stewards  
Engineers & Scientists  
2000 - 2010

Certified



# Enviro-Stewards Inc.

*An engineering firm and Certified B Corporation that helps clients:*

- increase their profits*
- sustain the environment, and*
- compellingly benefit society.*

Take the free  
B Impact Assessment

Search  
for B Corps

By location, industry etc.

## Enviro-Stewards Working for Clean Drinking Water in Sudan



What makes us a better company?

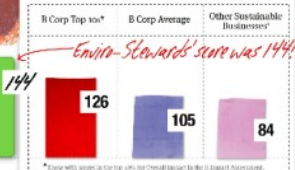
### B Impact Report

Certified since: September 2011

Summary:	Company Score	Median Score*
Governance	20	10
Workers	40	22
Community	41	32
Environment	38	9
Overall B Score	138	80

80 out of 200 is eligible for certification  
 \*Of all businesses that have completed the **B Impact Assessment**  
 \*Median scores will not add up to overall

Top 10%  
Overall Impact



BEST OF  
THE  
BEST  
FOR  
OVERALL  
IMPACT

Little Big Shots

These smaller B Corps are big in impact, scoring in the top 10% for Overall Impact among B Corps with fewer than 10 employees.

Automotive Project  
Big City Farms  
Corp Power / Northeast  
Dandelion  
Dandelion  
Edgewise Education  
Enviro-Stewards  
FOP Yearly Meeting  
Greenlight Apparel  
Haven for Dogs

Little Pickle Press  
Mindful Investors  
Natural Investments  
New Avenue  
Patriotic Ventures  
Pivotal Production  
SAREEPOUR  
Social Enterprise Associates  
Socibiki  
Sustainability Television

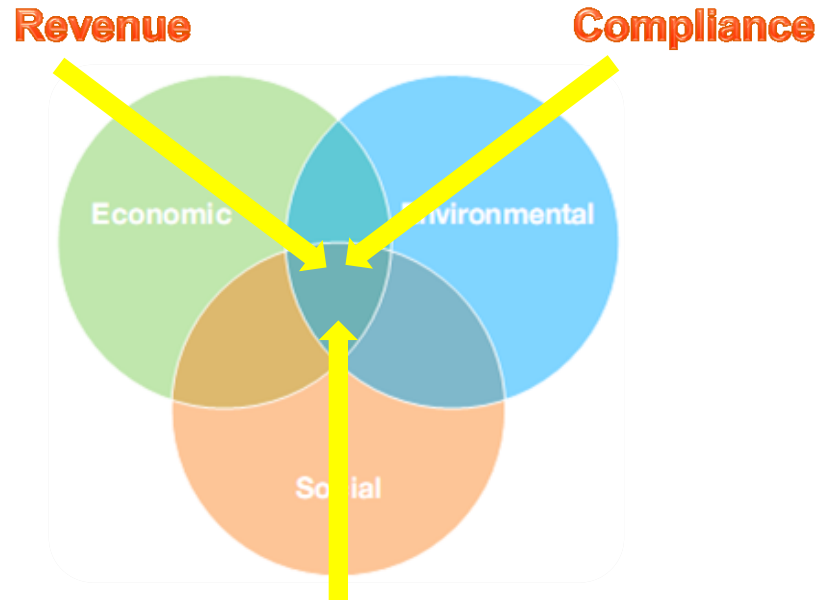
B Corps are 25%  
Better than OSBs

Top 10% are 50%  
Better than OSBs

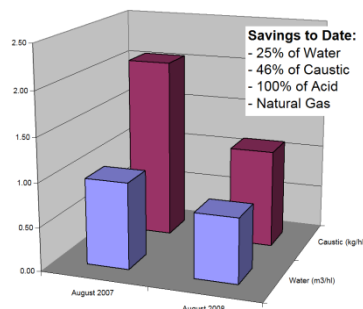
• Future World Bank  
Global Green Energy Corp  
Green Building Services  
Larry's Beans  
Michael Products  
Moving Forward Education  
Nanase Solar  
New Resource Bank  
Next Street  
Partnership Capital Growth  
Piedmont Trailways  
Pivot Group  
Re/Vision Architecture  
RecycleBank  
South Mountain Company  
Southern Energy Management



# Sustainability Catalysts



As of Aug 2008: **Responsibility**  
Savings \$0.064/bottle



## Water Conservation

*Case Study: Brick Brewing Co Limited*

Location: Kitchener, ON

Potential water savings: 68,300 m<sup>3</sup>/yr

Potential dollars saved: \$157,000/yr

### Introduction

Brick Brewing Co Limited operates a packaging and distribution centre located in Kitchener, Ontario. Beer from Brick's brewing facility is trucked daily to the distribution centre, where it undergoes further processing and storage prior to packaging. The distribution centre also receives returned bottles which are washed at the facility and refilled.

Under the Regional Municipality of Waterloo's W.E.T. Program, Brick retained the services of Enviro-Stewards to complete a water conservation assessment. The purpose of the assessment was to identify conservation opportunities, quantify savings and approximate their financial returns.

### Immediate Conservation Measures Presently Being Implemented

- A reduction of 59,500 m<sup>3</sup>/yr in water consumption (39%);
- Net savings of \$150,000/yr;
- 0.3 year payback.

### Total for Recommended Conservation Measures

- A reduction of 68,300 m<sup>3</sup>/yr in water consumption (44%);
- Net savings of \$157,000/yr;
- 0.4 year payback.



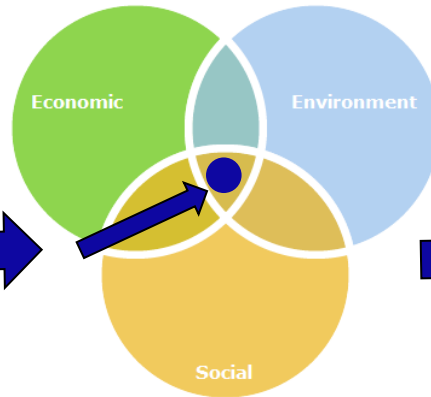
# Enviro-Stewards' Approach

**Save**



**Increase net  
profit margin**

**Sustain**



**Implement Feasible  
Sustainability Measures**

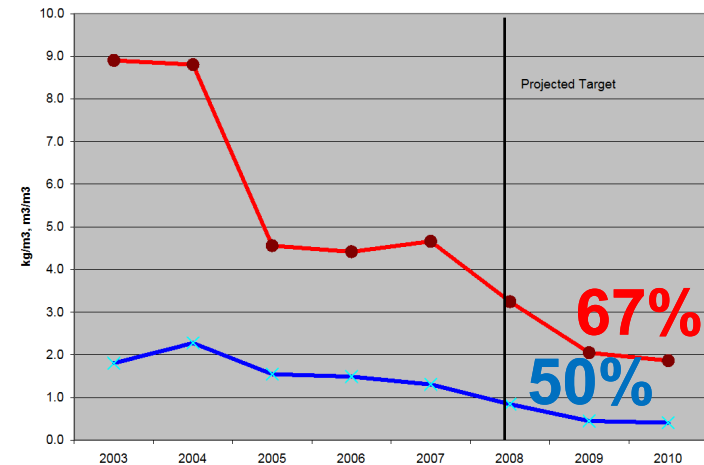
**Share**



**Track, Report and  
Reinvest**

# Approach

1. Who are Your Champions?
2. What are Your Wastes?
3. Why are Your Wastes Generated?
4. Where can they be Improved?
5. When should they be Implemented?



## Who? – Gaining Buy-In

- To facilitate change, a multi-disciplinary team participates in kick-off training and progress meetings.

We engage representation from management, engineering, maintenance, operations, QA/QC, etc.



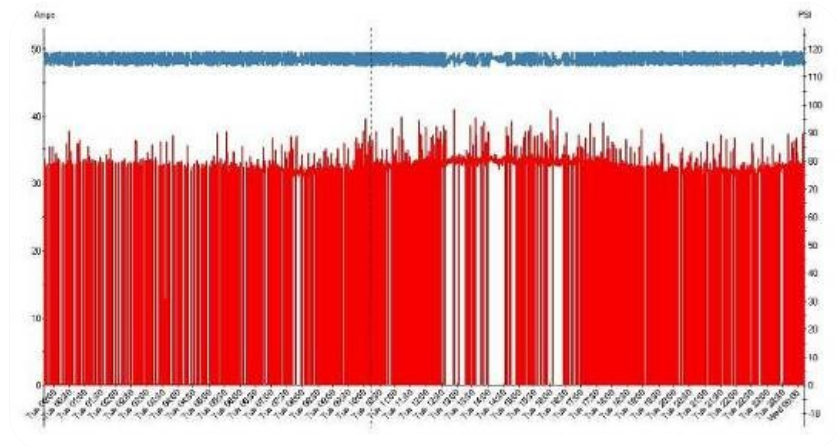
# What?

## What? – Collecting Reliable Data:

- A detailed and systematic assessment of consumption and waste generation is conducted.

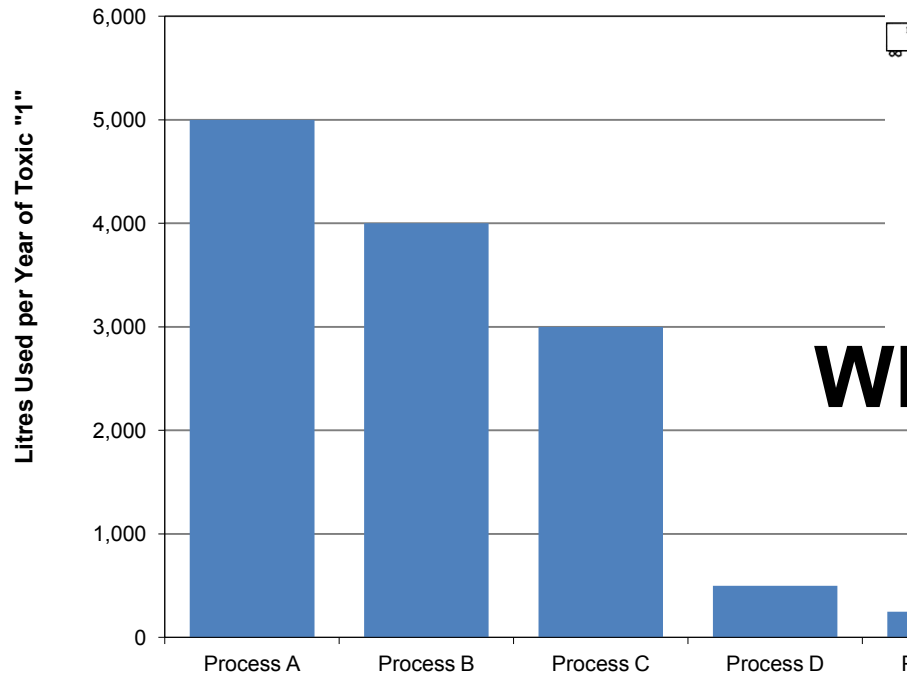


Data loggers, flow meters, amp meters, and visual observation are just some of the tools we use to collect consumption and waste generation data.

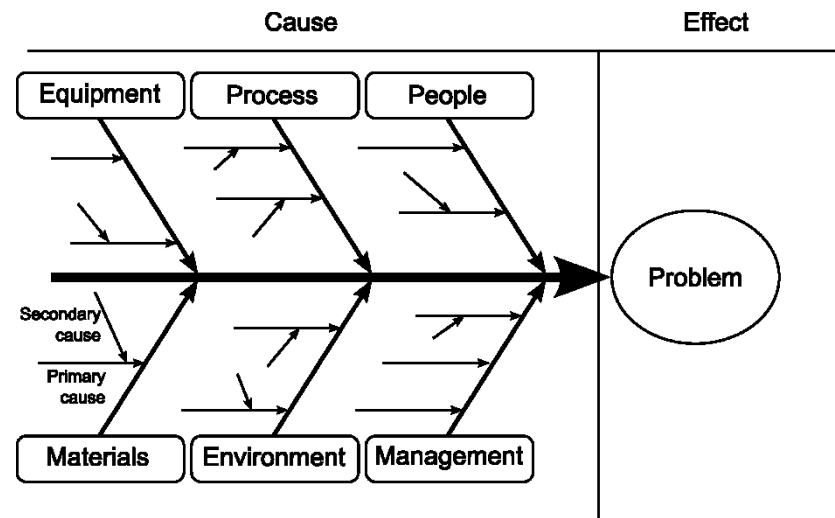
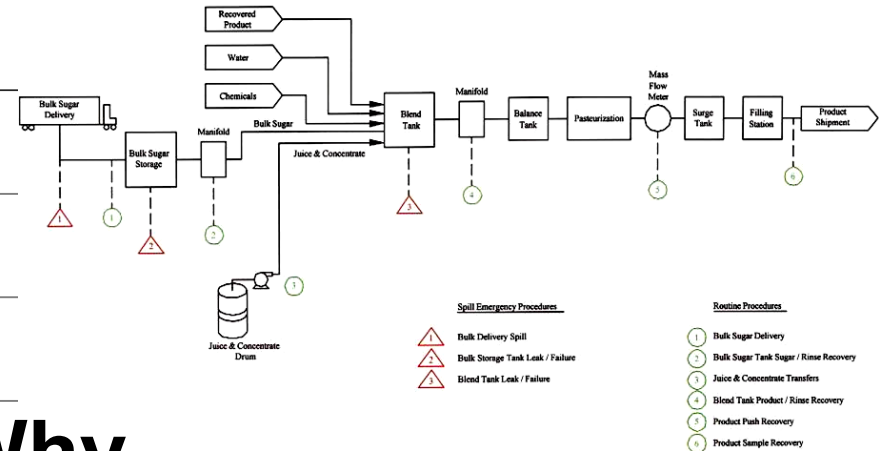


# Where & Why?

## Where



## Why





# When?

**TOTAL ESTIMATED CAPITAL COSTS** **\$70,000**

**TOTAL ESTIMATED ANNUAL O&M COSTS**  
(RELATIVE TO STATUS QUO) **(\$54,457)**

**STRAIGHTLINE PAYBACK PERIOD (yrs)** **1.3**

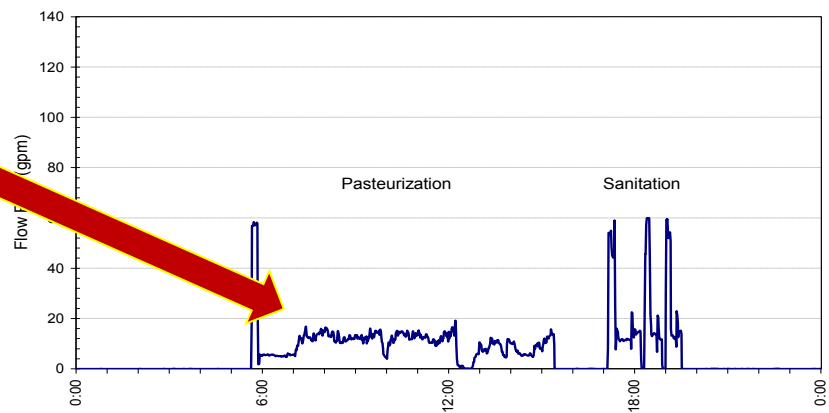
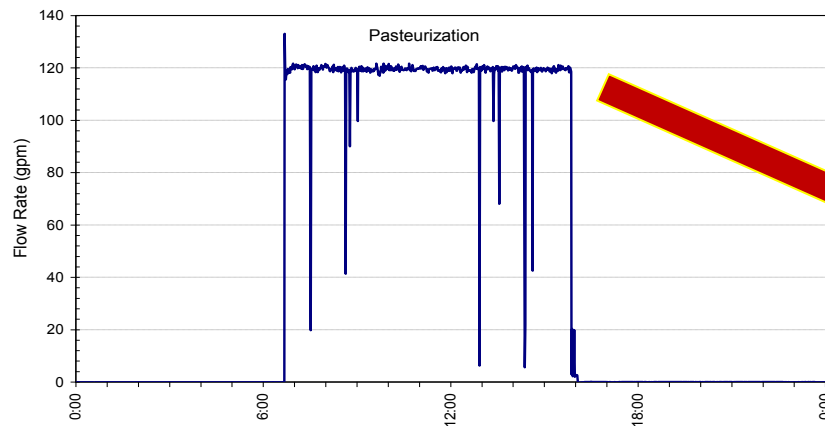
**77% ROI**

**NET PRESENT VALUE BEFORE TAXES**  
(assuming 20yr project life, 5% interest) **\$748,656**

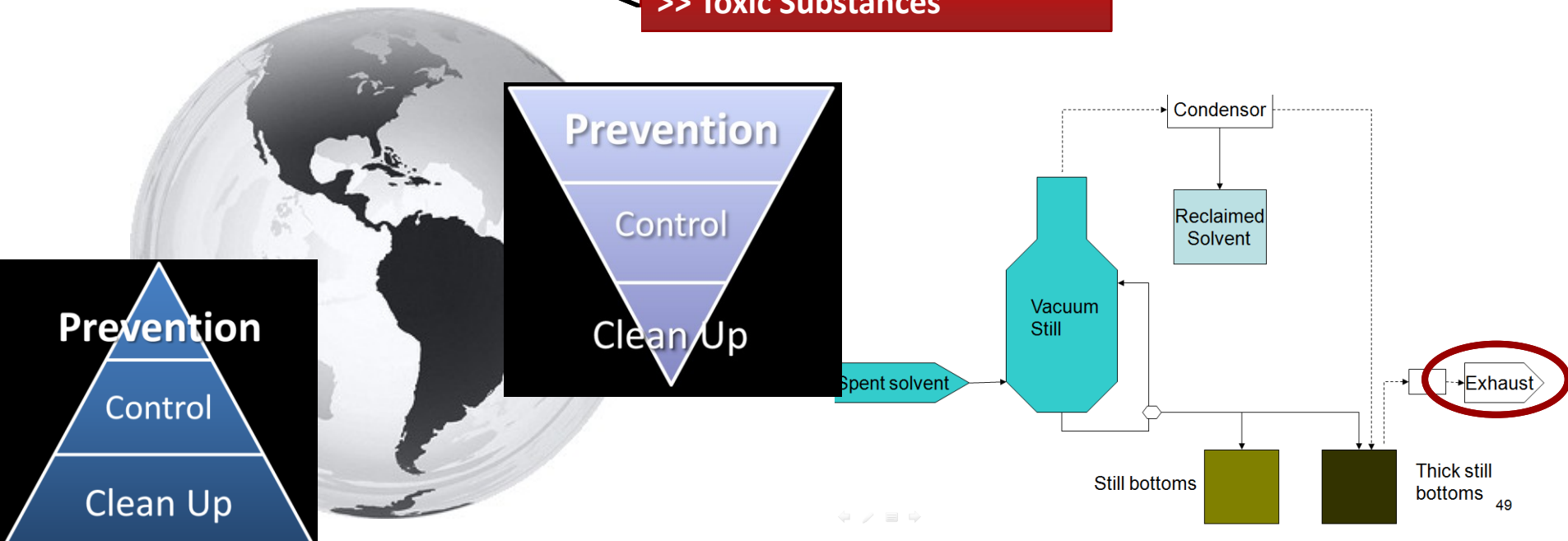
# Monitoring, Tracking and Reporting

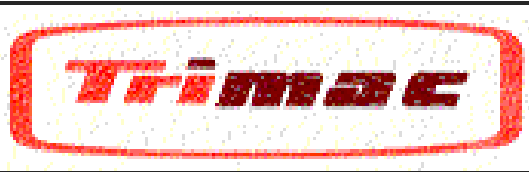
## Documenting & Retaining Gains:

- Data loggers, email alerts, and quarterly conservation certificates verify and retain economic, environmental and social gains



# The "New Way": Preventative Approach



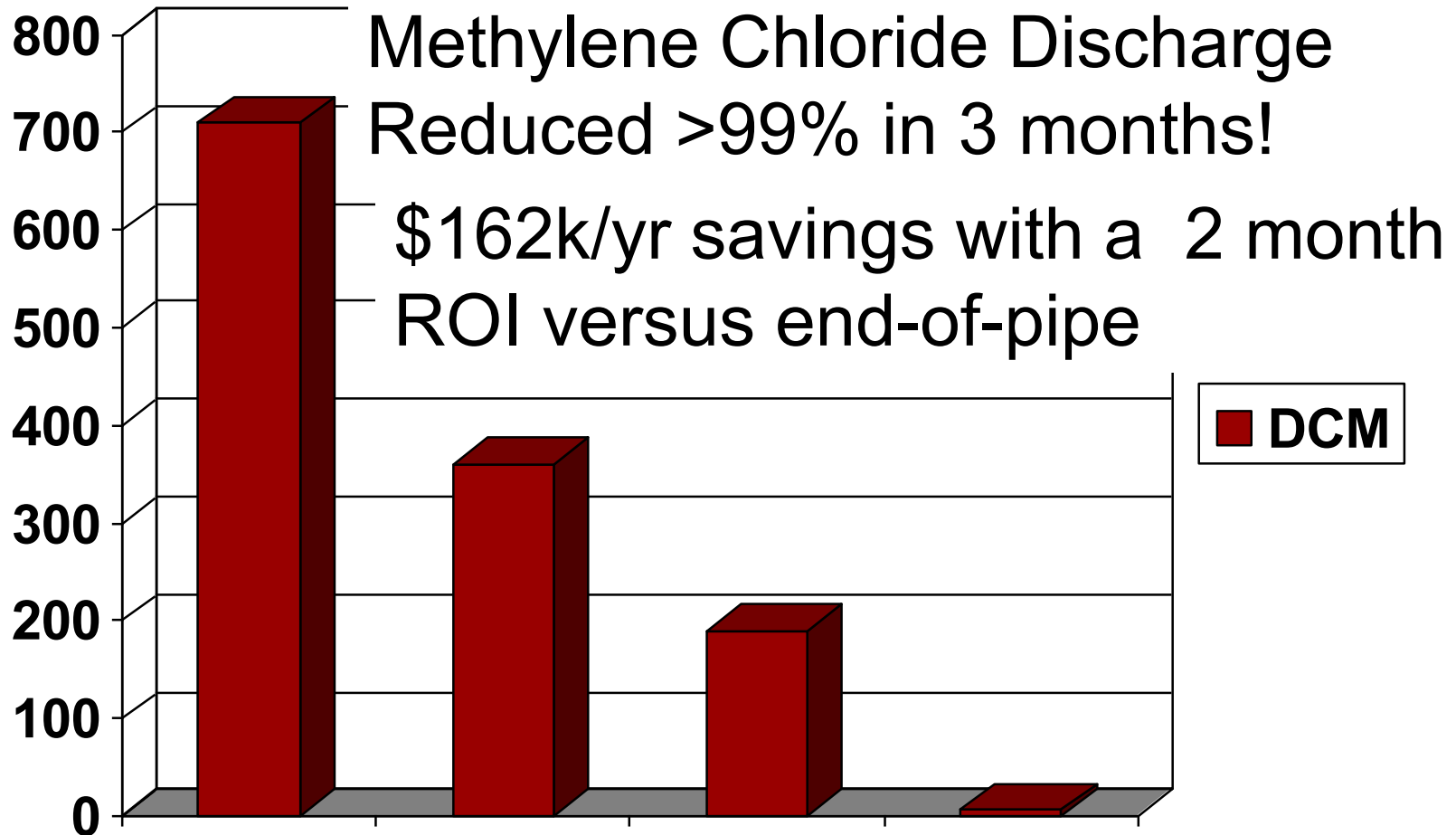


# Trimac (Automotive)





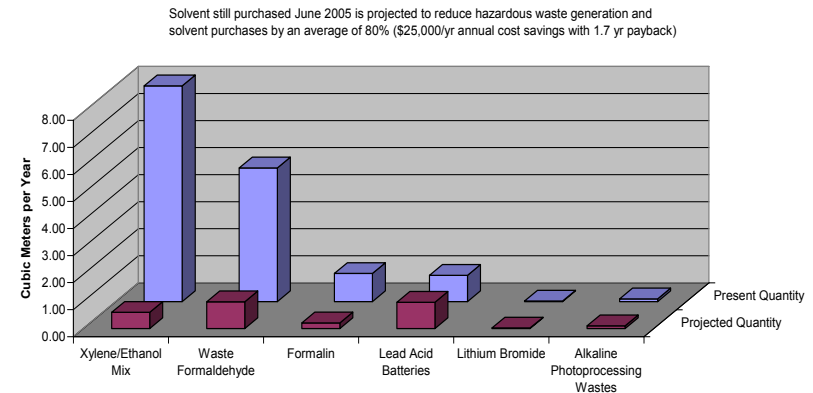
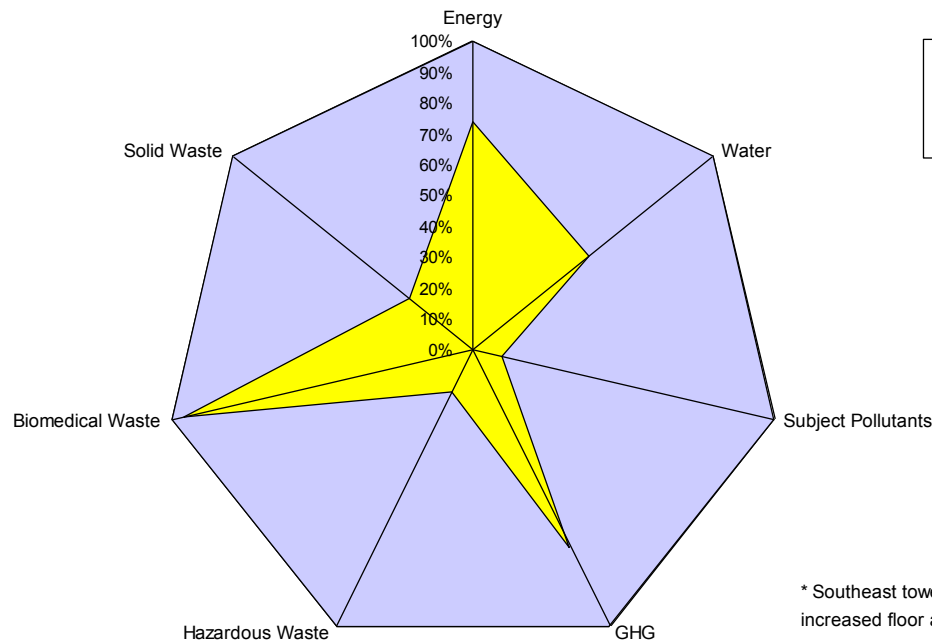
## Trimac (Automotive)





# Health Care Case Study

(per m<sup>2</sup> Basis\*)



\* Southeast tower expansion in 2004 increased floor area by 22,000m<sup>2</sup>.



NYGH receiving the CCME Award for their toxics reduction achievements.





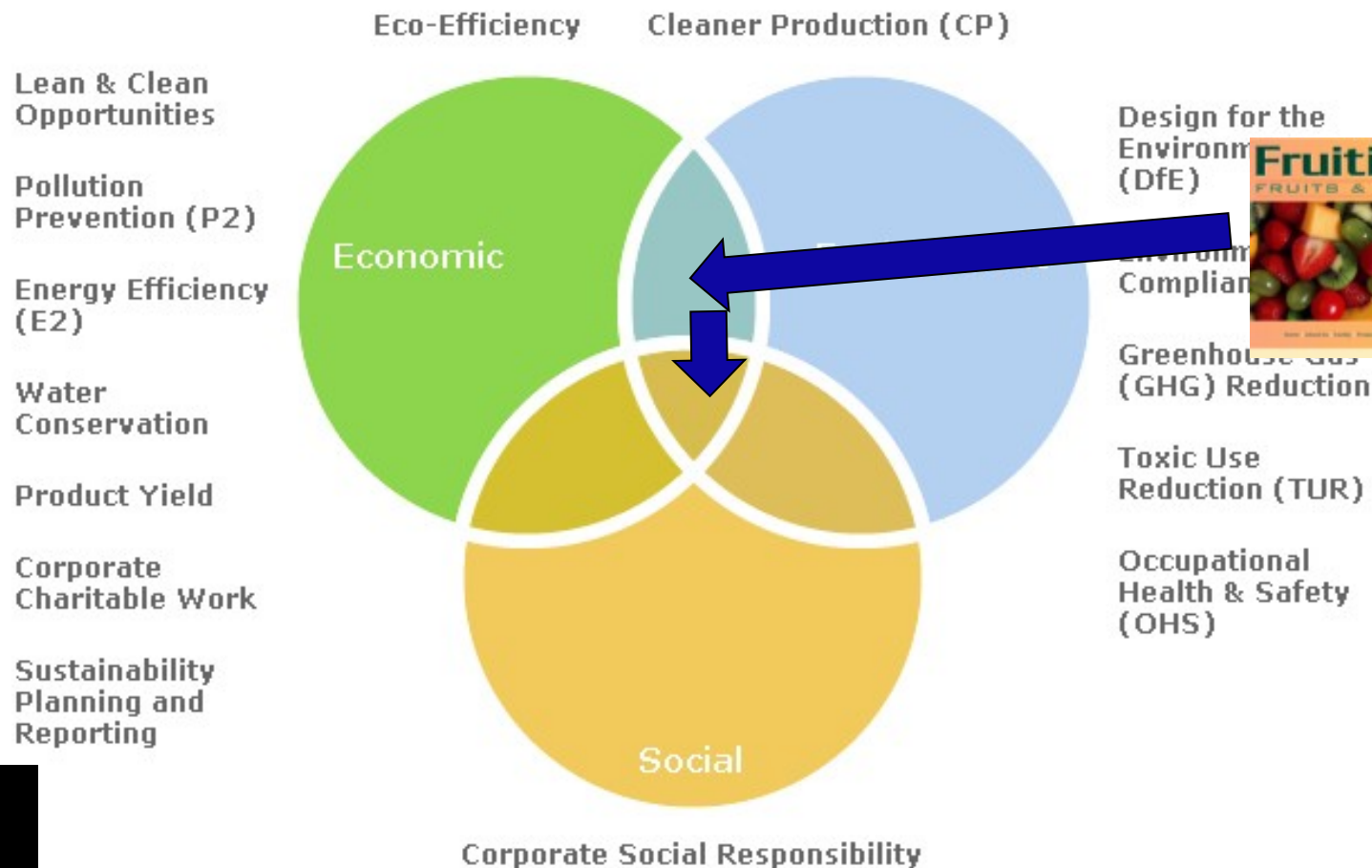






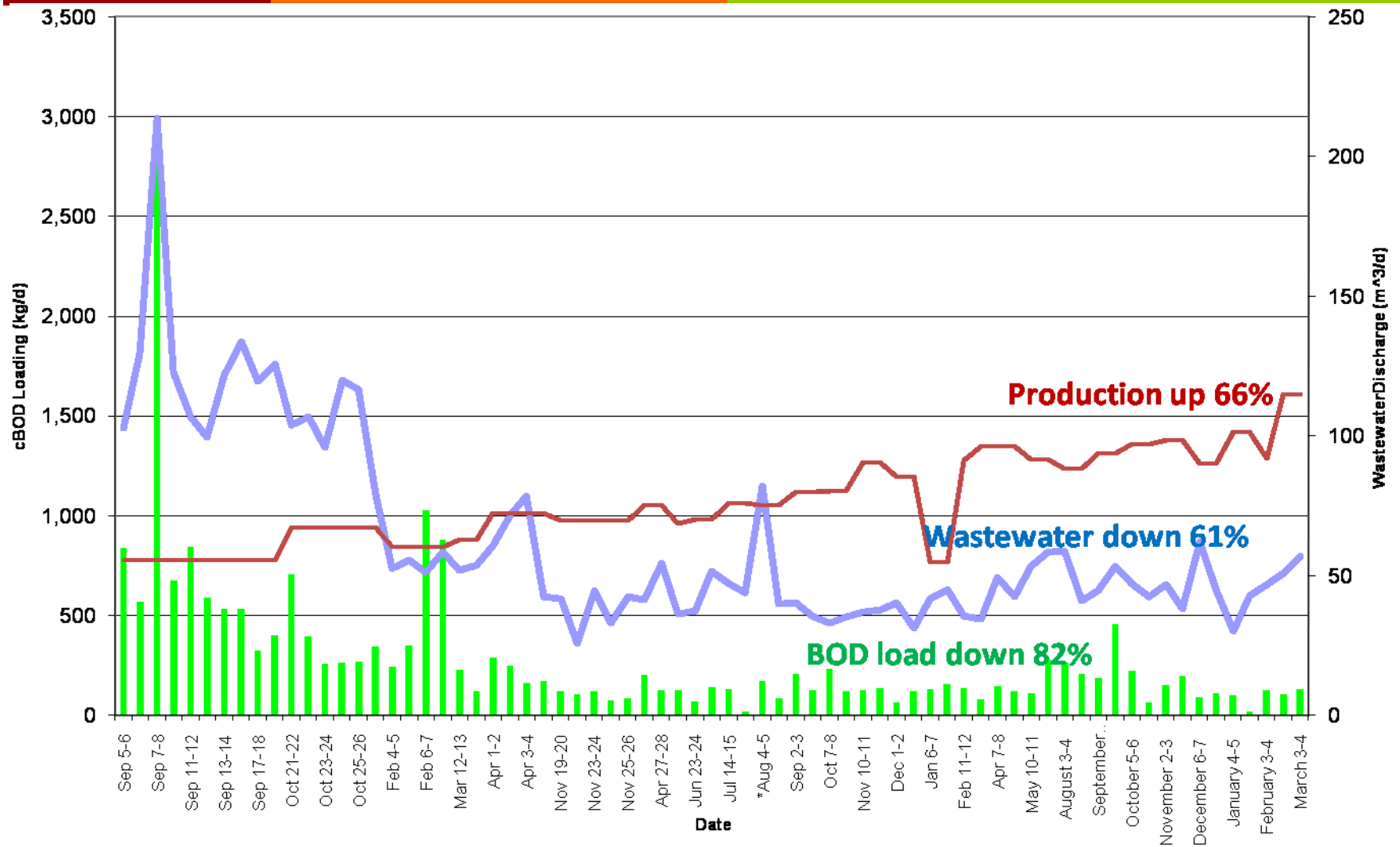
# Case Study: Tim Hortons

## Enviro-Stewards Builds Pathways to Sustainability





# Results:



# Cost Savings:

Category	Annual Savings		Canadian
	Quantity	Units	Dollars
Electricity	852277	kwh	\$ 85,227.72
Natural Gas	164294	m3	\$ 49,288.32
wastewater volume	36748	m3	\$ 91,869.02
wastewater organic loading	240024	kg	\$ 120,011.93
Greenhouse gas emissions	560	tonnes	N/A (yet)
Solid waste to landfill	510	tonnes	\$ 3,750.00
Sewer Surcharge	140285	\$	<u>\$ 140,285.40</u>
			<b>\$ 490,432</b>

**Note: 260% ROI on company's total expenditure of \$187.5k**  
**3,500% ROI for government's incentive (\$140k/yr of taxes)**

# Multimedia Footprint:

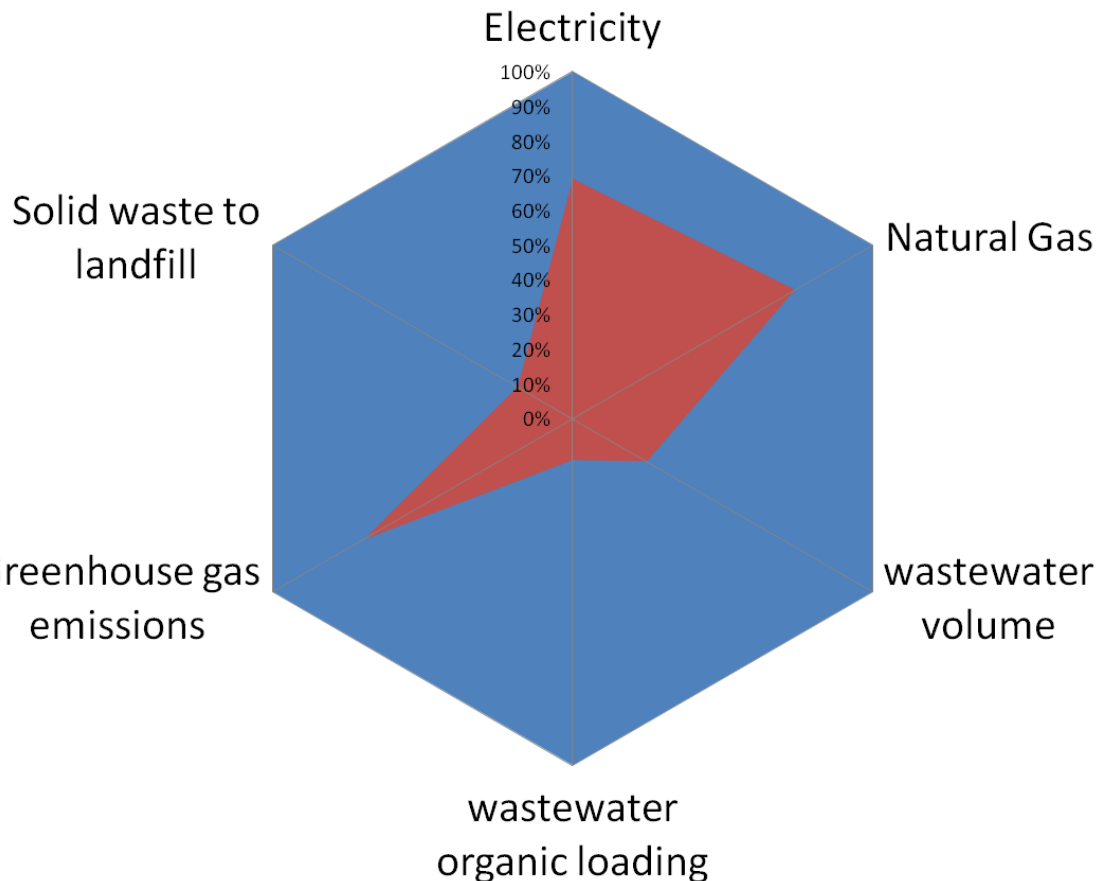
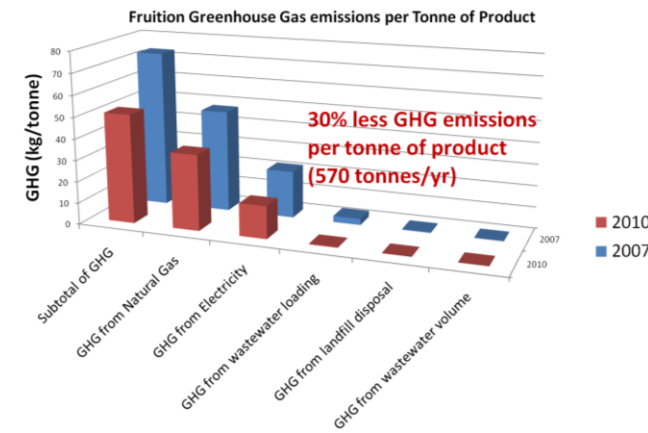
## Fruition Fruit & Fills' Footprint per tonne of Product

## Stakeholder Benefits:

1. Employee Bonus Structure
2. Job security (thriving employer)
3. Worker engagement
4. Working environment (dust, water)
5. less use of commons (water, ingredients, energy, land)

■ 2007

■ 2010



SHARE YOUR FEEDBACK WITH US!


 GO

## 2011 SUSTAINABILITY & RESPONSIBILITY REPORT

OVERVIEW

INDIVIDUALS

COMMUNITIES

THE PLANET

GRI INDEX

### DID YOU KNOW ?

Since 2010, our Fruition Fruits and Fills facility has purchased BioSand filters to help offset some of its water use. These filters have provided 800,000 L per year of clean drinking water to the people of South Sudan, which helps prevent water-related illnesses such as

## Revival Movement Centre: BSF Construction



See red pin in above map for location of the Revival Movement Centre (zoom into cluster of markers near the bottom of the map view).

## Information on business

### Local company earns B Corporation certification

Gail Martin  
Independent Editor

An Elmira company is one of only 20 companies in Canada that has been certified as a B Corporation.

If you don't know what that means, you're not alone.

B Corporations are a relatively new concept. It is a certification that tells the world that at your business, maximizing profit is not the only bottom line environmental and social concerns are also at the forefront.

At Enviro-Stewards, however, the B Corporation certification is merely a recognition of the way the business has always run, since day one.

Bruce Taylor, founded Enviro-Stewards in 2001, after realizing his career as a chemical engineer

not-for-profit, or a for-profit corporation.

He opted to go the for-profit route, in part because that would make it easier for him to work with prospective clients.

"You wouldn't find a company asking Greenpeace to come in and do an environmental audit," said Taylor. "A for-profit has more credibility (in the business field)."

Even so, Taylor incorporated many of the tenets that are hallmarks of an NGO — donating 10 per cent of profits to charitable organizations, providing a living wage to his employees, and providing volunteer and work projects for his employees.

"Because of this, we get incredibly loyalty from our staff," said Taylor.

In the recent economic downturn, instead of laying off employees, staff took one day a week

head of Fruition, came with Taylor on a future trip, donating water filtration units, as well as empty pails and a fruit-drying unit, providing a way for families in the area to preserve fruit, something they couldn't do before.

The way he treats his employees, combined with the heart of Taylor's work — helping corporations find environmental efficiencies that are not only good for the environment, but also good for the bottom line (and staff morale as well) — made the B Corporation designation an easy fit.

Taylor was encouraged to go through the certification process after attending a recent conference.

He had to go through a rigorous list of questions — including questions that highlight the wage gap between the

es in Kajo  
nstructed on  
(see map on  
0 litres  
id 3 tonnes  
hat would

### How BSFs Work

/yr 120 tonnes/yr  
GHGs avoided

- Constructed using locally available materials
- Provides local employment
- Improves the health & productivity of the community

Enviro-Stewards Inc.  
(519) 578-5100  
mail@enviro-stewards.com  
Increase, Sustain, Share.







































## KIAMBIU SAFE DRINKING WATER PROJECT

SAFE WATER FOR HEALTH & ECONOMIC EMPOWERMENT

John 4:13-14

Jesus answered, "Everyone who drinks this water will be thirsty again, but whoever drinks the water I give him will never thirst. Indeed, the water I give him will become in him a spring of water welling up water for eternal life."



Water purifying plant



Clean water ready for use

FINANCED BY THE  
GOVERNMENT

FINANCED BY THE  
GOVERNMENT



# A Journey Towards Sustainability

Enviro-Stewards & Tim Hortons:  
Waste discharge reduction



**Enviro-Stewards**  
Engineers & Scientists



SAVE.SUSTAIN.SHARE.  
[www.enviro-stewards.com](http://www.enviro-stewards.com)





# Contact Us



**Enviro-Stewards**  
Engineers & Scientists  
2000 - 2010

*Thank You!*

**ENVIRO-STEWARDS INC.**

1 Union Street  
Elmira, Ontario  
N3B 3J9

**Phone:** (519) 578-5001

**Fax:** (519) 669-5002

Or visit us at our website:

***[www.enviro-stewards.com](http://www.enviro-stewards.com)***





# **Business Value of Pollution Prevention & Sustainability**

International Case Studies

**Question and Answer**  
**Fred Granek & Bruce**  
**Taylor**



# Question & Answer

- Do you have questions or comments for speakers?
- We have three questions for you:
  1. How can we help the executives of small to medium sized manufacturers understand that a P2 approach to sustainability is one of the most profitable and secure investments that a firm can make?
  2. How can we overcome the cultural inertia that leads to perpetuation of the status quo, ie. To achieve both corporate and employee buy-in?
  3. How can we go beyond the low hanging fruit project mentality to a true culture of continuous improvement?

# Thank You!

**Fred Granek**  
**Canadian Centre**  
**for Pollution**  
**Prevention**

**Bruce Taylor**  
**Enviro-Stewards Inc.**

